

GTXGN-12 系列核心单元

GTXGN-12 Series Core Unit



1. 产品概述 Overview

GTXGN-12/630(1250)-20(25)固体绝缘开关是固体绝缘环网柜的核心，是将真空断路器或负荷开关、隔离开关、接地开关集成一体化设计，结构紧凑，采用前后布置形式，前面为开关操动机构，后面为开关的一次部分。减少了中间不必要的传动环节，省力、省零件，传动效率高。一次部分采用 APG 自动凝胶工艺，将一次部分的真空灭弧室和隔离、接地开关完全固封在特殊的环氧树脂中，作为固封极柱单元，其绝缘、电气性能优越。固体绝缘开关可整体作为一个模块与开关柜组装成不同功能单元；开关的操动机构和隔离开关的操动机构都是模块化机构，隔离开关和主开关的弹操机构已实现互锁，而且机构零件少，减少了不必要的传动环节，可靠性高，并且隔离开关可根据用户需要实现电动操作。

- 极柱单元一体化、高爬距，具有优异的电场性能；
- 采用真空灭弧室、刀闸式隔离、接地开关；
- 开关本体防护等级高，具备抗凝露功能；
- 主母线出线及电缆出线采用标准欧式接头，易拼柜，安全可靠；
- 特殊环氧树脂绝缘材料：
 - a. 机械强度高；
 - b. 抗开裂性、热收缩性、导热性、抗老化性好；
 - c. 大于 110℃ 的高玻璃化温度，使环氧树脂在高温运行环境下绝缘能力不下降；
- 熔丝筒结构的独特设计，水平放置及熔丝前置方式，更换熔管方便，撞针机构简单可靠，也可有效阻止水汽进入筒内，提高了长期运行的安全性；
- 操动机构界面简单清楚，便于操作，开关机械联锁位置简单可靠，能有效防止误操作，隔离断口可视 LED 灯，安全性高；
- 隔离开关可根据用户需要实现电动操作，可真正实现配网自动化；
- 维护方便，打开面板即可进行零件更换和线路检查；

GTXGN-12/630(1250)-20(25) solid insulated switch is the core of the solid insulated ring network cabinet. It is an integrated design of vacuum circuit breaker or load switch, isolating switch, and earth switch. It has a compact structure and is arranged in front and back form, the front is the switch operating mechanism, and the back is the primary part of the switch. It reduces unnecessary transmission links in the middle, saves labor and parts, and has high transmission efficiency. The primary part adopts APG automatic gel process, and the vacuum interrupter and isolating and earth switch of the primary part are completely sealed in a special epoxy resin as a embedded pole unit, it has superior insulation and electrical performance. The solid insulated switch can be integrated as a module and assembled into different functional units with the switch cabinet; the operating mechanism of the switch and the operating mechanism of the isolating switch are modular mechanisms, have been interlocked, and there are few mechanical parts, unnecessary transmission links are reduced, the reliability is high, and the isolating switch can be operated electrically according to user needs.

- Integrated pole unit, high creepage distance, excellent electric field performance;
- Use vacuum interrupter, knife-gate isolating and earth switch;
- The switch body has high protection level and has anti-condensation function;
- The main bus and cable outlets adopt standard European style connectors, which are easy to assemble, safe and reliable;
- Special epoxy resin insulation material:
 - a. High mechanical strength;

b. Good crack resistance, thermal shrinkage, thermal conductivity, and aging resistance;

c. High glass transition temperature greater than 110°C, so that the insulation ability of epoxy resin will not decrease in high temperature operating environment;

- The unique design of the fuse barrel structure, horizontal placement and fuse front method, easy to replace the fuse, simple and reliable striker mechanism, can also effectively prevent water vapor from entering the barrel, improving the safety of long-term operation;
- The interface of the operating mechanism is simple and clear, easy to operate, the switch mechanical interlock position is simple and reliable, which can effectively prevent misoperation, and the isolating distance with visible LED light which makes it high in safety;
- The isolating switch can be operated electrically according to user needs, which can truly realize the automation of distribution network;
- Easy maintenance, parts replacement and circuit inspection can be performed by opening the face panel;

2. 使用环境 Use Conditions

- 海拔高度≤4000m;
- 环境温度: -45°C~+70°C;
- 相对湿度: 日平均值≤95%, 月平均值≤90%;
- 安装环境: 周围空气没有爆炸性和腐蚀性气体, 安装场所无剧烈振动冲击, 污秽级不超过 GB/T5582 中的 III 级;
- 抗震强度: ≤9 度;
- 特殊环境使用请与本公司协商;
- Altitude ≤4000m;
- Ambient temperature: -45°C~+70°C;
- Relative humidity: daily average ≤95%, monthly average ≤90%;
- Installation environment: there is no explosive and corrosive gas in the surrounding air, no severe vibration and impact in the installation place, and the pollution level does not exceed the level III in GB/T5582;
- Seismic strength: ≤9 degrees;
- For special environment use, please consult with our company;

3. 应用领域 Application Field

- 低温寒冷地区: 无 SF6 气体应用, 无需考虑 SF6 气体低温运行问题, 在-45°C下也能正常运行。
- 高原地区: 无需考虑高原大气压对绝缘性能的影响。
- 强风沙地区: 固体绝缘环网柜本体安全防护等级 IP67, 控制回路室采用特殊处理确保强风沙地区长期运行。
- 沿海潮湿地区: 环氧树脂密封, 抗潮湿, 抗盐雾腐蚀, 确保在沿海地区能长期使用。
- 高环保要求地区: SF6 气体对大气温室化影响已经高度引起重视, 固体环网柜取消了 SF6 气体, 对环境 and 人身无任何污染和伤害。
- 智能电网中: 由于主开关, 隔离开关都能实现电动, 选配本公司研发的智能控制器, 可对开关设备和变电站现场进行遥控、遥测、遥讯, 既能进行分散控制, 又能方便集中控制。
- Low temperature and cold area: No SF6 gas application, no need to consider the low temperature operation of SF6 gas, and it can operate normally at -45°C.
- Plateau area: No need to consider the influence of plateau atmospheric pressure on insulation performance.

- Strong sandy areas: The solid insulated ring main unit has a safety protection level of IP67, and the control circuit room adopts special treatment to ensure long-term operation in strong sandy areas.
- Coastal damp areas: epoxy resin sealing, resistance to moisture and salt spray corrosion, to ensure long-term use in coastal areas.
- Areas with high environmental protection requirements: The impact of SF6 gas on atmospheric warming has attracted great attention. The solid insulated ring network cabinet has cancelled SF6 gas, and there is no pollution and harm to the environment and people.
- Smart grid: Since the main switch can be electric operated, the intelligent controller can be used to remotely control, remotely measure and remotely communicate the switchgear and substation site, which can perform decentralized control and facilitate centralized control.



4. 技术参数 Technical Parameters

项目 Item		单位 Unit	断路器单元 Circuit breaker unit	负荷开关单元 Load break switch unit	熔断器组合电器单元 Fuse combination unit
额定电压 Rated voltage		kV	12	12	12
额定频率 Rated frequency		Hz	50	50	50
额定电流 Rated current		A	630(1250)	630(1250)	取决于熔断器电流额定值 Depends on the rated current of fuse
工频耐压 Power frequency withstand voltage	相间, 相对地 Phase-to-phase, phase-to-earth	kV	42	42	42
	真空断口, 隔离断口 Vacuum distance, isolating distance		48	48	48
	控制和辅助回路 Control and auxiliary circuit		2	2	2

雷电冲击耐压 Lightning impulse withstand voltage	相间, 相对地 Phase-to-phase, phase-to-earth	kV	75	75	75
	真空断口, 隔离断口 Vacuum distance, isolating distance		85	85	85
额定短时耐受电流 Rated short time withstand current		kA	20(25)/4S	20(25)/4S	/
额定峰值耐受电流 Rated peak value withstand current		kA	50(63)	50(63)	/
额定短路关合电流 Rated short circuit making current		kA	50(63)	50(63)	受限于高压熔断器 Limited by HV fuse
额定短路开断电流 Rated short circuit breaking current		kA	20(25)	20(25)	
额定转移电流 Rated transfer current		A	/	/	1700
额定有功负载电流 Rated active load current		A	/	/	/
额定闭环开断电流 Rated closed loop breaking current		A	630(1250)	630(1250)	/
内部燃弧试验 (AFLR 级) Internal arc test (AFLR)		kA/S	20(25)/0.5S	20(25)/0.5S	/
局部放电 (1.2Ur) Partial discharge		PC	≤10	≤10	/
防护等级 (柜体) Protection degree (cabinet)			IP4X	IP4X	IP4X
主回路电阻 Main circuit resistance		μΩ	≤120	≤120	/
机械寿命 Mechanical life	断路器/负荷开关 Circuit breaker/load break switch	次 times	10000	10000	10000
	隔离/接地开关 Isolating/earth switch		3000	3000	3000

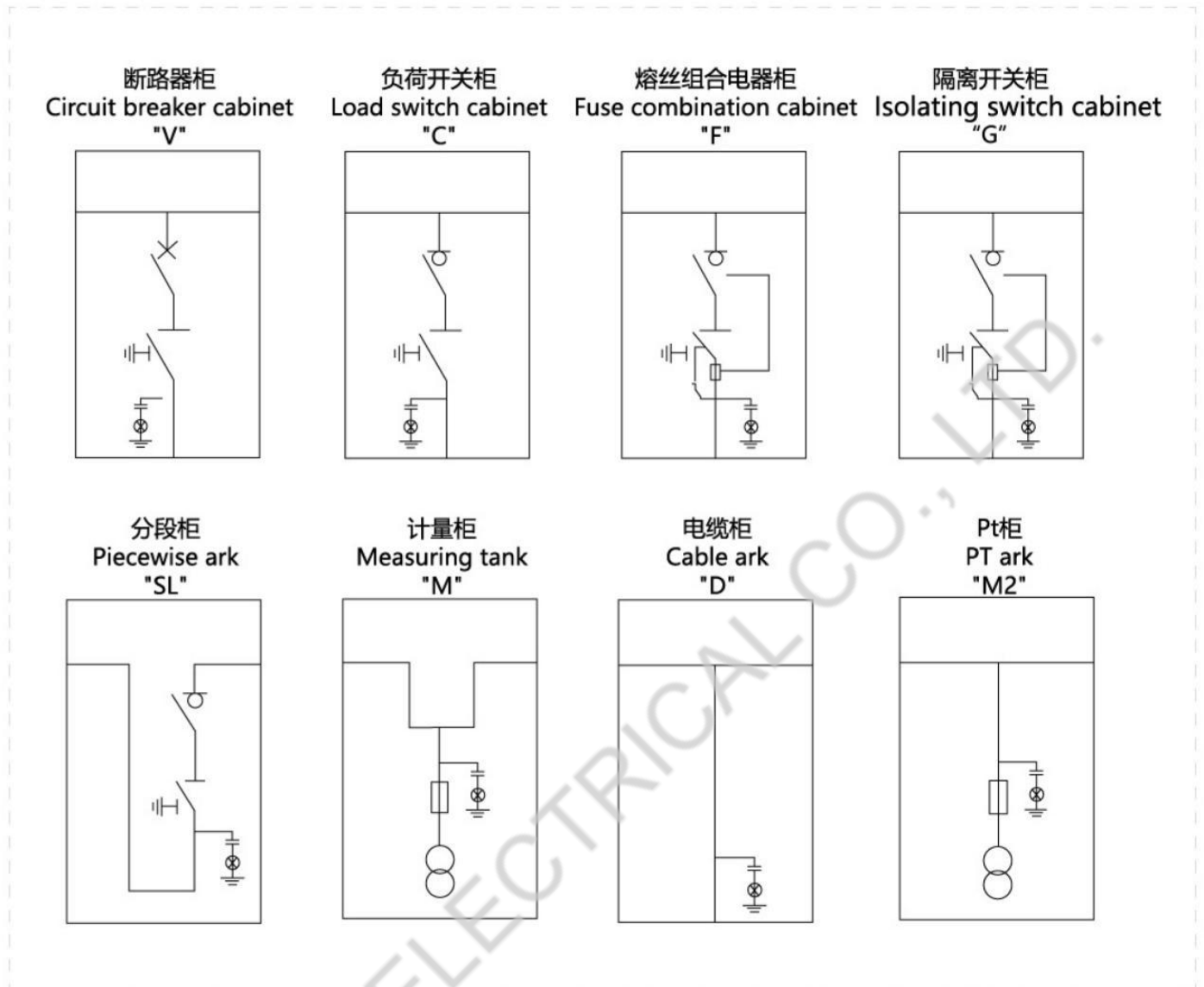
5. 安全与保护 Safety and Protection

- 设计了有 LED/接地状态可视窗口, 可查看接地合位, 为操作及进行电缆施工提供安全保障;
- 标准的带电显示器, 用于回路的带电检测, 为操作人员提供有效的操作安全指示;
- 密封隔室设计, 有效防止外部物体误入;
- 满足五防联锁(机械及电气联锁), 防止操作人员误操作;
- 系统主回路与大气完全隔离, 在产品上设计了专门的燃弧泄压通道, 保证操作人员和设备的安全;
- 不使用 SF6 气体, 采用成熟的真空灭弧技术及固体绝缘, 为开关柜提供了紧凑及环保的设计;
- 一次回路采用最少的接点设计, 确保运行期间低能耗;
- A visual window with LED/grounding status is designed to view the grounding position, providing safety guarantee for operation and cable construction;
- The standard charged display is used for the live detection of the loop, and provides effective operation safety instructions for the operator;
- The sealed compartment design can effectively prevent foreign objects from entering by mistake;
- Meet the five-prevention interlock (mechanical and electrical interlock) to prevent misoperation by the operator;
- The main circuit of the system is completely isolated from the atmosphere, and a special arc pressure relief channel is designed on the product to ensure the safety of operators and equipment;
- Not use SF6 gas, adopt mature vacuum arc extinguishing technology and solid insulation, providing a compact and environmentally friendly design for the switchgear;
- The primary circuit adopts minimal contact design to ensure low energy consumption during operation;

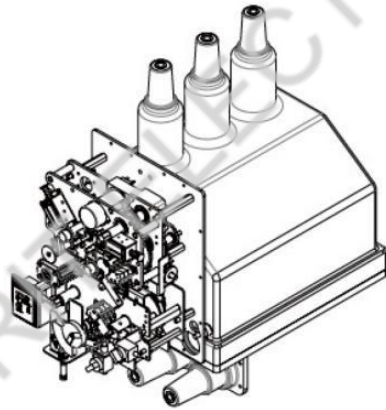
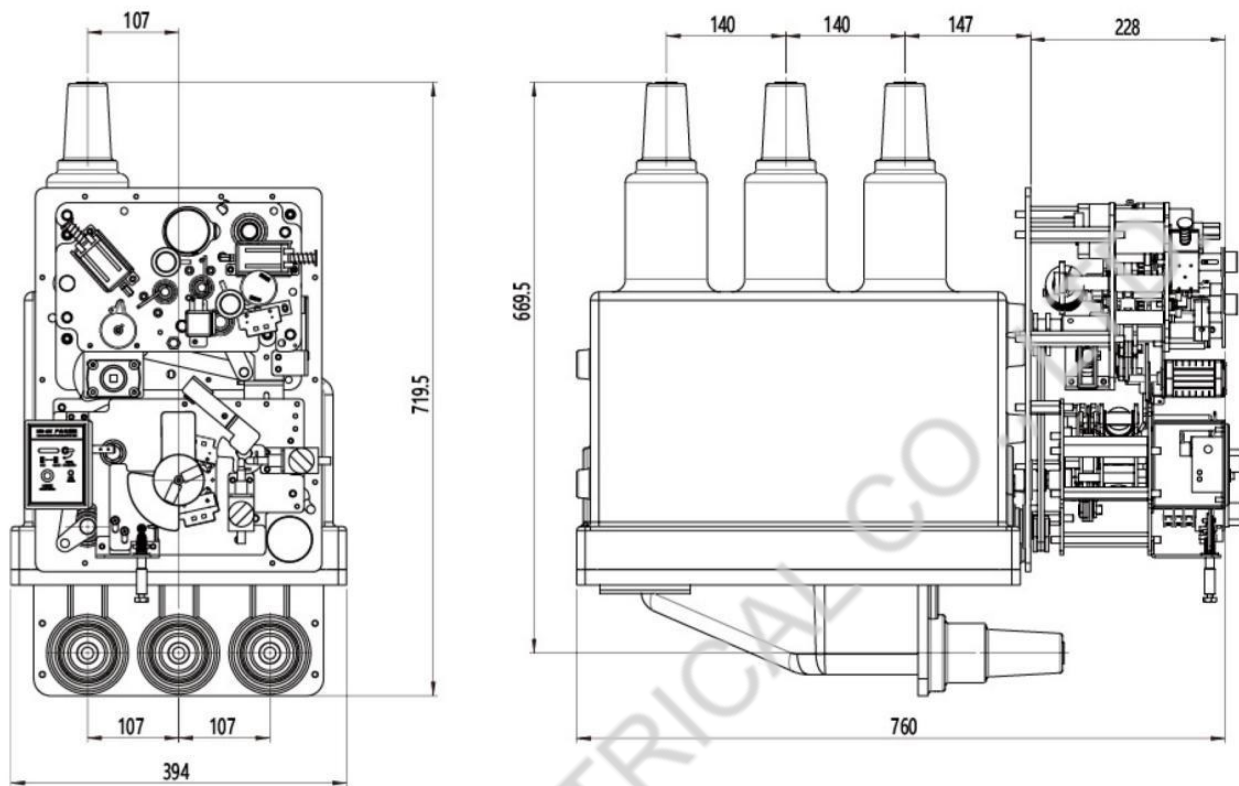
6. 产品细节展示（面板式机芯） Details (face panel type core unit)



7. 设计方案 Design Scheme



8. 外形与安装 Overall Dimensions and Installation





GHORIT ELECTRICAL CO., LTD.